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TECHNOLOGY CENTER 2800

CLAIMS

1. A high PRF plasma gun including:

a center electrode;

an outer electrode substantially coaxial with said center electrode, a coaxial column

5 being formed between said electrodes, which column has a closed base end and an open exit end;

an inlet mechanism for introducing a selected gas into said column;

a plasma initiator at the base end of said column;

10 a solid state simulated high voltage RF source selectively connected to drive said plasma initiator, said RF source operating at a frequency in the range of 10 MHZ to 1000 MHZ; and

a solid state, high repetition rate pulsed driver operable on plasma initiation at the base of said column for delivering a high voltage pulse across said electrodes, the plasma expanding from the base end of the column and off the exit end thereof.

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2. Cancelled.

3. A plasma gun as claimed in claim 1 wherein said simulated RF source includes an N stage non-linear magnetic pulse compressor, where N is an integer  $\geq 1$ ;

20 a solid state switch selectively operable for connecting an energy storage device to an input of a first stage of said compressor;

an output stage having a resonant circuit at an RF frequency F to be simulated, said resonant circuit including a capacitor  $C_R$  and a saturable reactor  $L_R$ , a last stage of said compressor having a capacitance  $C_N$ , at least one of  $C_R$  and  $L_R$  being selected so that there is a  
25 reverse voltage on  $C_N$  before  $C_R$  is fully charged,  $L_R$  successively saturating to cause oscillating of  $C_R$  at frequency F; and

a coupling circuit for coupling energy from  $C_R$  to drive said plasma initiator.

4. A plasma gun as claimed in claim 3, wherein said solid state switch is one of an SCR,  
30 an IGBT and a MOSFET.

5. A plasma gun as claimed in claim 3, wherein  $C_R$  is selected such that  $C_R > C_N$ .

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